Dell™ Wireless 5540 HSPA Mobile Broadband Mini-Card User's Guide

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Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

Export Regulations

Customer acknowledges that these Products, which may include technology and software, are subject to the customs and export control laws and regulations of the United States (U.S.) and may also be subject to the customs and export laws and regulations of the country in which the Products are manufactured and/or received. Customer agrees to abide by those laws and regulations. Further, under U.S. law, the Products may not be sold, leased or otherwise transferred to restricted end-users or to restricted countries. In addition, the Products may not be sold, leased or otherwise transferred to, or utilized by an end-user engaged in activities related to weapons of mass destruction, including without limitation, activities related to the design, development, production or use of nuclear weapons, materials, or facilities, missiles or the support of missile projects, and chemical or biological weapons.

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Introduction

Dell™ Wireless 5540 HSPA Mobile Broadband Mini-Card User's Guide

- Mobile Broadband Connectivity
- GPS

Mobile Broadband Connectivity

Your Dell Wireless 5540 HSPA Mobile Broadband Mini-Card keeps you in touch, enabling you to use the best available mobile service wherever you are. It supports tri-band UMTS and quad-band GSM:

GSM	850 MHz	**UMTS**	850 MHz
GPRS	900 MHz		900 MHz
EDGE	1800 MHz	**HSPA**	1900 MHz
	1900 MHz		2100 MHz

Your Dell Wireless 5540 HSPA Mobile Broadband Mini-Card supports the following communications services. It also includes a GPS receiver.

Service	Maximum Download Speed	Maximum Upload Speed
HSPA	7.2 Mbps	2.0 Mbps
UMTS	384 kbps	384 kbps
EDGE	247.4 kbps	123.7 kbps
GPRS	53.6 kbps (CS-2) 85.6 kbps (CS-4)	26.8 kbps (CS-2) 42.8 kbps (CS-4)

Where UMTS service with HSPA is available, your Dell Wireless 5540 HSPA Mobile Broadband Mini-Card can connect at speeds up to 7.2 Mbps. Your Dell Wireless 5540 HSPA Mobile Broadband Mini-Card provides automatic fallback to to UMTS where HSDPA is not available and to EDGE or GPRS service where UMTS is not available (network support required). This section describes the services that the Dell Wireless 5540 HSPA Mobile Broadband Mini-Card supports:

- High Speed Packet Access (HSPA)

  HSPA is an enhancement to UMTS networks. HSDPA (High Speed *Downlink* Packet Access) enables the downlink speed to be dramatically increased; up to 7.2 Mbps using the Dell Wireless 5540 HSPA Mobile Broadband Mini-Card. File downloads will be faster, whilst applications such as video streaming may operate at higher quality and greater reliability. The maximum speed available depends on the configuration of the mobile network and local conditions such as distance to the base station. HSUPA (High Speed *Uplink* Packet Access) enables the Dell Wireless 5540 HSPA Mobile Broadband Mini-Card to upload data at speeds up to 2.0 Mbps.

- Universal Mobile Telecommunications System (UMTS)

  UMTS is a 3G technology standard for wide-area wireless data communication that is based on the GSM standard. The UMTS standard uses advanced network operator mobile Internet services to achieve data transfer rates up to 384 kbps, which are ideal for media streaming, video MMS, instant shopping, and banking.

- Enhanced Data Rates for Global Evolution (EDGE)

  EDGE enhances GPRS by increasing data throughput over GPRS by as much as three times, depending upon the network radio signal strength and quality. GPRS networks that are enhanced with EDGE are often referred to as Enhanced GPRS (E-GPRS) networks. EDGE provides the "always on" capability of GPRS but at faster speeds. EDGE technology is transparent — simply make a GPRS connection as usual and benefit from the increase in speed where EDGE is available in a network. When EDGE is available you can expect increased speeds of up to 200 kbps, dependent

on network coverage.

- General Packet Radio Service (GPRS)

  GPRS is a type of network connection that provides "always on" mobility. The connection set up is fast. After you are connected, applications can send and receive data whenever required. In today's GPRS networks, the Dell Wireless 5540 HSPA Mobile Broadband Mini-Card receives data at speeds up to 53.6 kbps and transmits at speeds up to 26.8 kbps.

- Short Message Service (SMS)

  You can send and receive SMS text messages using the Text Messages window in Dell's Universal Connection Manager.

GPS

Your Dell Wireless 5540 HSPA Mobile Broadband Mini-Card also contains a GPS (Global Positioning System) receiver which can be used with web-based services and GPS-enabled application software to provide location-based services such as navigation and security.

The GPS has two modes, standalone and assisted. The Standalone mode calculates the position from data received from GPS satellites. Assisted mode enhances the GPS performance by downloading satellite data from a GPS assistance server. The assisted GPS uses either Internet Assisted or Network Assisted mode to calculate the position.

Technical Specifications

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General

Item	Description
Product name	Dell Wireless 5540 HSPA Mobile Broadband Mini-Card
System	GSM 850 E-GSM 900 GSM 1800 GSM 1900 UMTS 850 UMTS 900 UMTS 1900 UMTS 2100 GPS
Interface	PCI MiniCard, internal to notebook
Services supported	GSM: GPRS/EDGE, SMS, USSD UMTS: Packet-Switched, HSDPA, HSUPA, Circuit-Switched, SMS, USSD Speech services are not supported GPS positioning
SIM Card	Small plug-in card, 3V and 1.8V type Regular (non-GPRS-aware) and GPRS-aware SIMs supported USIM

Exterior Description

Dimention	Description
Size	**Length:** 51 mm **Width:** 30 mm **Depth:** 4.2 mm

Weight	12g
Battery	Powered via the notebook.
Antenna	Diversity antenna integrated in laptop

Ambient Temperatures

Mode	Description
Operating	-20 to 65° C
Storage	-20 to 70° C

Environmental Compliance

Directives	WEEE (Waste Electrical and Electronic Equipment Directive) RoHS (Restriction of use of certain Hazardous Substances)

Electrical Characteristics

Item	Description
Supported voltages	3.0 - 3.6 V
Nominal operating voltage	3.3 V
Average Standby Power (inactive)	< 30 mW
Average Idle Power (GPRS attached)	< 50 mW
Data Transfer Power (Worst case)	< 3.0 W

NOTE: All power consumptions are at nominal voltage.

HSPA (HSDPA/HSUPA) Technical Data

Item	Description
Maximun downlink speed	7.2 Mbps
HSDPA Categories	Category 1 to 8
Maximum uplink speed	2.0 Mbps
HSUPA Categories	Category 1, 3, 5

Speed achieved depends on the numerous factors such as signal strength, traffic levels and the configuration of the HSPA Network.

UMTS Technical Data

Item	Description
Power class	Class 3 (0.25 W, 24 dBm)
Maximum Downlink speed	384 kbps

Maximum Uplink speed	384 kbps
UMTS features	Inter-Mode Handover (UMTS/EDGE/GPRS) Inter-Mode Reselection (UMTS/EDGE/GPRS)
Quality Of Service	Supported
Modes	IP
IP Allocation	Dynamic
USAT	UMTS SIM Application Toolkit: Supported
R4 Enhancements	Extended TBF Uplink Network Assisted Cell Change (NACC)

Speed achieved depends on the numerous factors such as signal strength, traffic levels and the configuration of the UMTS Network.

EDGE Technical Data

Item	**Description**
Device class	EDGE Class 10
Modulation Coding Schemes	MCS-1 to MCS-9
EDGE features	Link Adaptation Incremental Redundancy Extended Uplink Temporary Block Flow (TBF) Network Assisted Cell Change (NACC)

EDGE Maximum Data Rates

		4 + 1		**3 + 2**	
Coding scheme	**Data rate per slot**	**Rx**	**Tx**	**Rx**	**Tx**
MCS-1	10.60	42.40	10.60	31.80	21.20
MCS-2	13.00	52.00	13.00	39.00	26.00
MCS-3	16.60	66.40	16.60	49.80	33.20
MCS-4	19.40	77.60	19.40	58.20	38.80
MCS-5	24.05	96.20	24.05	72.15	48.10
MCS-6	31.25	125.00	31.25	93.75	62.50
MCS-7	47.45	189.80	47.45	142.35	94.90
MCS-8	57.05	228.20	57.05	171.15	114.10
MCS-9	61.85	247.40	61.85	185.55	123.70

Speed achieved depends on the Coding scheme supported by the GSM Network.

Data rate is the payload per slot: header plus data.

GSM Performance and Technical Characteristics

Dimension	GSM 850	GSM 900 E-GSM 900	GSM 1800	GSM 1900
Modulation	GMSK/8-PSK	GMSK/8-PSK	GMSK/8-PSK	GMSK/8-PSK
Power classes	Class 4 (2W) for GSM/GPRS and EGPRS/MCS 1-4 (GMSK); Class E2 (0.5W) for EGPRS/MCS 5-9 (8-PSK)	Class 4 (2W) for GSM/GPRS and EGPRS/MCS 1-4 (GMSK); Class E2 (0.5W) for EGPRS/MCS 5-9 (8-PSK)	Class 1 (1W) for GSM/GPRS and EGPRS/MCS 1-4 (GMSK); Class E2 (0.4W) for EGPRS/MCS 5-9 (8-PSK)	Class 1 (1W) for GSM/GPRS and EGPRS/MCS 1-4 (GMSK); Class E2 (0.4W) for EGPRS/MCS 5-9 (8-PSK)

GSM Features Supported

Item	Description
ME SIM Lock	Network Network Subset Service Provider Corporate
Online services (SIM-AT)	Supported.
USSD	Phase 2+

GPRS Technical Data

Item	Description
Data Rates	Multislot class 10 supported (see table below) Coding schemes: CS-1, CS-2, CS-3 and CS-4
Mode of Operation	Class B (attaches to both GSM and GPRS at the same time)
IP Connectivity	PDP type IP is supported IPv4
SMS over GPRS	Mobile Originated and Mobile Terminated
Compression	TCP/IP Header Compression (RFC1144 and RFC 2507) V42bis
GPRS Encryption	GEA1 and GEA2
GPRS IP allocation	Dynamic

GPRS Maximum Data Rates

		CS-1 9.05 kbps	CS-2 13.4 kbps	CS-3 15.6 kbps	CS-4 21.4 kbps
4 + 1	**RX**	36.2	53.6	62.4	85.6
	TX	9.05	13.4	15.6	21.4
3 + 2	**RX**	27.15	40.2	46.8	64.2
	TX	18.1	26.8	31.2	42.8

Speed achieved depends on the Coding Scheme supported by the GSM network.

Data rate is the payload per slot: header plus data.

Firmware Upgrade

Item	Description
Firmware upgrade	See www.dell.com for firmware upgrade information

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GPS Technical Data Modes Standalone and Internet Assisted

Item	Description
Interface	USB virtual COM port Automatic receiver enable upon port open Simultaneous port open for multiple GPS applications
Protocol	NMEA 2.0
Channels	8 hardware channels Up to 20 satellite tracking via software channels
Antenna	Antenna integrated in laptop

Regulatory

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Operational Information

Wireless Interoperability

The Dell Wireless 5540 HSPA Mobile Broadband Mini-Card is designed to be interoperable with the specific wireless service providers and their roaming partners. The Dell Wireless 5540 HSPA Mobile Broadband Mini-Card is based on GSM {Group Special Mobile} radio technology that applies to the applicable standards.

Safety

Dell Wireless 5540 HSPA Mobile Broadband Mini-Card, like other radio devices, emits radio frequency electromagnetic energy. The level of energy emitted by this device, however, is less than the electromagnetic energy emitted by other wireless devices such as mobile phones. The Dell Wireless 5540 HSPA Mobile Broadband Mini-Card operates within the guidelines found in radio frequency safety and recommendations. These standards and recommendations reflect the consensus of the scientific community and result from deliberations of panels and committees of scientists who continually review and interpret the extensive research literature. In some situations or environments, the use of the Dell Wireless 5540 HSPA Mobile Broadband Mini-Cards may be restricted by the proprietor of the building or responsible representatives of the applicable organization.

Examples of such situations include the following:

- Using the Dell Wireless 5540 HSPA Mobile Broadband Mini-Card on board airplanes, or
- Using the Dell Wireless 5540 HSPA Mobile Broadband Mini-Card in any other environment where the risk of interference with other devices or services is perceived or identified as being harmful.

If you are uncertain of the policy that applies to the use of wireless devices in a specific organization or environment (an airport, for example), you are encouraged to ask for authorization to use the Dell Wireless 5540 HSPA Mobile Broadband Mini-Card before you turn it on.

WARNING: Explosive Device Proximity Warning – Do not operate a portable transmitter (such as a wireless network device) near unshielded blasting caps or in an explosive environment unless the device has been modified to be qualified for such use.

CAUTION: Use on Aircraft – Regulations of the FCC and FAA prohibit airborne operation of radio-frequency wireless devices because their signals could interfere with critical aircraft instruments.

Regulatory Information

The Dell Wireless 5540 HSPA Mobile Broadband Mini-Card must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. Dell Inc. is not responsible for any radio or television interference caused by unauthorized modification of the devices included with this Dell Mobile Broadband, or the substitution or attachment of connecting cables and equipment other than that specified by Dell Inc. The correction of interference caused by such unauthorized modification, substitution or attachment is the responsibility of the user. Dell Inc. and its authorized resellers or distributors are not liable for any damage or violation of government regulations that may arise from the user failing to comply with these guidelines.

United States, FCC Notices

FCC Radiation Exposure Statement

CAUTION: The radiated output power of the Dell Wireless 5540 HSPA Mobile Broadband Mini-Card is far below the FCC radio frequency exposure limits. Nevertheless, the Dell Wireless 5540 Mobile Broadband Mini-Card should be used in such a manner that the potential for human contact during normal operation is minimized. Details of the authorized configurations can be found at https://fjallfoss.fcc.gov/oetcf/eas/reports/GenericSearch.cfm by entering the FCC ID number on the device.

CAUTION: This device has been evaluated for and shown compliant with the FCC RF exposure limits under portable exposure conditions (antennas are within 20 cm of a person's body) when installed in certain specific OEM configurations. This device has also been evaluated and shown compliant with the FCC RF Exposure limits under mobile exposure conditions (antennas are greater than 20cm from a person's body). Details of the authorized configurations can be found at https://fjallfoss.fcc.gov/oetcf/eas/reports/GenericSearch.cfm by entering the FCC ID number on the device.



Interference Statement

This device complies with Part 15 of the Federal Communications Commission (FCC) Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested to, and found to be within the acceptable limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates radio frequency energy and is designed for use in accordance with the manufacturer's user manual. However, there is no guarantee that interference will not occur in any particular installation. If this equipment causes harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for help

NOTE: This Dell Mobile Broadband Mini-Card must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. Any other installation or use will violate FCC Part 15 regulations. Modifications not expressly approved by Dell could void your authority to operate the equipment.

European Union, EU Declaration of Conformity

European Union, R&TTE Compliance Statement

Hereby, Dell Inc. declares that this Dell Wireless Mobile Broadband Mini-Card is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Европейски съюз, R&TTE Декларация за съответствие

С настоящото, Dell Inc. декларира, че това мобилно широколентово (broadband) устройство Dell е в съответствие с основните изисквания и другите свързани разпоредби на Директива 1999/5/EC.

Evropská unie, Prohlášení o shodě R&TTE

Společnost Dell Inc. tímto prohlašuje, že toto mobilní širokopásmové zařízení Dell splňuje základní požadavky a další příslušná ustanovení Směrnice 1999/5/ES.

Erklæring om overholdelse af Den Europæiske Union/R&TTE-direktivet

Dell Inc. erklærer hermed, at dette mobile bredbåndsminikort fra Dell er i overensstemmelse med de obligatoriske krav og andre relevante forudsætninger i direktiv 1999/5/EF.

Verklaring van overeenstemming met de R&TTE-richtlijnen van de Europese Unie

Hierbij verklaart Dell Inc. dat dit Dell Mobile Broadband Mini-Card voldoet aan de vereisten en andere relevante bepalingen van richtlijn 1999/5/EC.

Euroopa Liit, R&TTE vastavuse avaldus

Käesolevaga teatab Dell Inc., et antud Dell mobiil-lairiba seade vastab direktiivi 1999/5/EC peamistele nõuetele ja teistele sellekohastele tingimustele.

Euroopan unionin R&TTE-direktiivin mukainen vaatimustenmukaisuusvakuutus

Dell Inc. vakuuttaa, että tämä Dell matkalaajakaistaminikortti täyttää direktiivin 1999/5/EY olennaiset vaatimukset ja muut asiaankuuluvat määräykset.

Union européenne, Avis de conformité R&TTE

Par la présente, Dell Inc. déclare que cette mini-carte large bande mobile Dell est conforme aux exigences essentielles et aux autres dispositions pertinentes de la Directive 1999/5/EC.

Europäische Union, R&TTE Konformitätsrichtlinie

Dell Inc. erklärt hiermit, dass dieses Dell Mobile Broadband Mini-Card mit den wesentlichen Anforderungen und anderen relevanten Regelungen der Richtlinie 1995/5/EG.

Ευρωπαϊκή Ένωση, Δήλωση συμμόρφωσης σχετικά με το ραδιοεξοπλισμό και τον τηλεπικοινωνιακό τερματικό εξοπλισμό (R&TTE)

Δια του παρόντος η Dell Inc. δηλώνει ότι αυτή η ευρυζωνική κινητή συσκευή της Dell συμμορφώνεται προς τις ουσιώδεις απαιτήσεις και τις λοιπές σχετικές διατάξεις της Οδηγίας 1999/5/ΕΚ.

Európai Unió, R&TTE megfelelőségi nyilatkozat

A Dell Inc. ezúttal kijelenti, hogy ez a Dell mobil szélessávú készülék megfelel az 1999/5/EK alapvető követelményeinek és más lényeges kikötéseinek.

Unione Europea, Dichiarazione di conformità alla R&TTE

Con la presente, Dell Inc. dichiara che questa mini-card a banda larga mobile è conforme ai requisiti essenziali e alle altre relative disposizioni della Direttiva 1999/5/CE.

Eiropas Savienības, R&TTE atbilstības deklarācija

Ar šo „Dell Inc." paziņo, ka šī „Dell" mobilā platjoslas pārraides ierīce atbilst Direktīvas 1999/5/EC pamatprasībām un citiem saistītiem noteikumiem.

Europos Sąjunga, R&TTE (Radijo įrenginių ir telekomunikacijų terminalo įrenginių) atitikties deklaracija

Dell Inc. pareiškia, kad šis Dell mobilusis plačiajuostės radijo signalų sistemos prietaisas atitinka Europos Parlamento ir Tarybos direktyvos 1999/5/EB esminius reikalavimus ir kitas tiesiogiai susijusias nuostatas.

Unjoni Ewropea, Dikjarazzjoni ta' Konformità R&TTE

Hawnhekk, Dell Inc., tiddikjara li dan it-tagħmir Dell Mobile Broadband hu konformi mal-ħtiġijiet essenzjali u provvedimenti rilevanti oħrajn ta' Direttiva 1999/5/KE.

Unia Europejska, Deklaracja zgodności R&TTE

Niniejszym, Dell Inc. oswiadcza, ze ta mobilna bezprzewodowa minikarta szerokopasmowa Dell jest zgodne z zasadniczymi wymogami i innymi odpowiednimi postanowieniami dyrektywy 1999/5/EC.

União Europeia, Declaração de conformidade R&TTE

Pela presente, a Dell Inc. declara que este mini-cartão de banda larga móvel Dell obedece às exigências essenciais e demais provisões relevantes da Directiva 1999/5/EC.

Declaraţie de conformitate cu Uniunea Europeană şi R&TTE (Echipament radio şi terminale de telecomunicaţii)

Prin prezenta, Dell Inc. declară că acest dispozitiv mobil de bandă largă marca Dell este în conformitate cu normele esenţiale şi prevederile relevante ale Directivei 1999/5/EC.

Európska únia, vyhlásenie o zhode R&TTE

Dell Inc. týmto vyhlasuje, že toto zariadenie Dell Mobile Broadband (širokopásmové) spĺňa základné požiadavky a ďalšie relevantné ustanovenia smernice 1999/5/ES.

Evropska unija, R&TTE izjava o ustreznosti

S tem, Dell Inc. Izjavlja, da ta Dell mobilna širokopasovna naprava ustreza bistvenim zahtevam in drugim pomembnimi določbami iz direktive 1999/5/EC.

Unión Europea, Declaración de conformidad R&TTE

Por la presente, Dell Inc. declara que este mini tarjeta de banda ancha móvil de Dell cumple con los requisitos esenciales y con otras provisiones correspondientes a la Directiva 1999/5/EC.

Europeiska Unionens, R&TTE följsamhets yttrande

Dell Inc. kungör härmed att Dells Mobila Bredbandsminikort är i överrensstämmelse med de väsentliga kraven och andra relevanta vilkor i 1999/5/EC direktivet.

Avrupa Birliği, Telsiz ve Telekomünikasyon Terminal Ekipmanı Uyumluluk Beyanı

Burada, Dell Inc. bu Dell Mobil Geniş Bant cihazının 1999/5/EC Direktifinin temel gereksinimlerine ve diğer ilgili hükümlerine uygun olduğunu beyan eder.